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EXAMINER
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ART UNIT	PAPER NUMBER
2858	

NOTIFICATION DATE	DELIVERY MODE
06/29/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/530,485	FRACHON ET AL.	
	Examiner	Art Unit	
	KENNETH J. WHITTINGTON	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *34* is/are allowed.

6)☒ Claim(s) *18-33,35 and 36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 September 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The Amendment and Remarks thereto filed April 10, 2009 have been entered and considered.

Claim Objections

Claim 1 is objected to because of the following informalities: “the magnet” in lines 7, 9 and 10 lacks antecedent basis. Prior to this term, the claims refers to "at least one magnet" but does not specify any single magnet. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 18, 19, 27 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Jansseune (US6043646).

Regarding claim 18, Jansseune discloses a variable reluctance transducer comprising:

a target made of a ferromagnetic material (See Jansseune FIG. note triggering part);

at least one magnet, the target and the magnet defining between one another an air gap (See FIG. Note magnet shown); and

a magnetosensitive element detecting a magnetic induction caused by a presence of the target and related to the air gap between the target and the magnet (See FIG. Note sensor 12), wherein the at least one magnet has a unidirectional magnetization along a direction substantially perpendicular to a front surface of the magnet bounding one edge of the air gap, the magnet having a cavity opening on the front surface of the magnet (See FIG. note magnet), the magnetosensitive element being seated in the cavity (See FIG. note sensor in cavity), the target having a geometric configuration such that the induction as a function of the position of the target corresponds to a predefined function (See FIG. note this is merely the property of any ferromagnetic target passing the sensor/magnet).

Regarding claim 19, Jansseune discloses the target is translationally mobile along an axis perpendicular to an axis of magnetization of the at least one magnet (See FIG. note movement of target).

Regarding claim 27, Jansseune discloses the magnetosensitive element is placed in the cavity in a zone of minimal induction (See FIG. note position of sensor within magnet).

Regarding claim 31, Jansseune discloses the target has a shape configured to generate a variation of thickness of the air gap that is a function of a position relative to the at least one magnet (See FIG. note that as the target moves, the air gap between the target and the magnet/sensor changes).

Claims 18, 20, 23-25, 31 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Hattori et al. (US4424705), hereinafter Hattori.

Regarding claim 18, Hattori discloses:

a target made of a ferromagnetic material (See Hattori FIG. 4, item 12);

at least one magnet, the target and the magnet defining between one another an air gap (See FIG. 4, item 13);

a magnetosensitive element detecting a magnetic induction caused by a presence of the target and related to the air gap between the target and the magnet (See FIG. 4, note sensor 17), wherein the at least one magnet has a unidirectional magnetization along a direction substantially perpendicular to a front surface of the magnet bounding one edge of the air gap, the magnet having a cavity opening on the front surface of the magnet (See FIG. 4, note magnet 13), the magnetosensitive element being seated in the cavity (See FIG. 4, note sensor 17 in cavity of magnet 13), the target having a geometric configuration such that the induction as a function of the position of the target corresponds to a predefined function (See FIG. 4, note this is merely the property of any ferromagnetic target passing the sensor/magnet).

Regarding claim 20, Hattori discloses the target translationally mobile along an axis parallel to an axis of magnetization of the at least one magnet (See FIG. 4).

Regarding claim 23, Hattori discloses the plane of the displacement of the target takes place is included in a plane passing through the center of the magnetosensitive element (See FIG. 4, note structure).

Regarding claim 24, Hattori discloses a ferromagnetic piece adhesively bonded to the back of the at least one magnet (See FIG. 4, item 14).

Regarding claim 25, Hattori discloses the at least one magnet adhesively bonded to a T-shaped ferromagnetic piece (See FIG. 4, items 14 and 16).

Regarding claim 31, Hattori discloses the target having a shape to generate a variation of thickness of the air gap that is function of position relative to the target (See FIG. 4 and disclosure related thereto).

Regarding claim 32, Hattori discloses the at least one magnet and the magnetosensitive element are disposed opposite a ferromagnetic membrane configured to be deformed under effect of a force applied vertically to a membrane (See FIG. 4 and disclosure related thereto).

Claims 18, 21 and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Carr et al. (US4745363), hereinafter Carr.

Regarding claim 18, Carr discloses:

a target made of a ferromagnetic material (See Carr FIGS. 1-4, wheel with teeth 16, 18, 20);

at least one magnet, the target and the at least one magnet defining between one another an air gap (See FIGS. 1-4, item 10);

a magnetosensitive element detecting a magnetic induction caused by a presence of the target and related to the air gap between the target and the magnet (See FIGS. 1-4, note sensor 14), wherein the at least one magnet has a unidirectional

magnetization along a direction substantially perpendicular to a front surface of the magnet bounding one edge of the air gap, the magnet having a cavity opening on the front surface of the magnet (See FIGS. 1-4, note magnet 10), the magnetosensitive element being seated in the cavity (See FIGS. 1-4, note sensor 14 in cavity of magnet 10), the target having a geometric configuration such that the induction as a function of the position of the target corresponds to a predefined function (See FIGS. 1-4, note this is merely the property of any ferromagnetic target passing the sensor/magnet).

Regarding claim 21, Carr discloses the target is rotationally mobile around a shaft perpendicular to an axis of magnetization of the at least one magnet (See FIGS. 1-4).

Regarding claim 33, Carr discloses the recited analog position sensor of claim 21 (See above with regard to claim 18).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 22, 26, 28, 30, 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carr in view of McDearmon et al. (US2004/0017190), hereinafter McDearmon.

Regarding claim 22, Carr teaches the features noted above, particularly the teeth being on the outer circumference of the target (See FIGS. 1-4, note teeth), but not axial teeth. McDearmon teaches a magnetic angular position sensor wherein the teeth for sensing are either on the circumference of the rotor (See McDearmon FIG. 2, note spiral teeth 6) or on an axial side of the rotor (See FIG. 3, note teeth 12) and the sensor faces the teeth (See FIGS. 2 and 3, item 5 and see paragraph 0022). It would have been obvious to use axial teeth in lieu of circumferential teeth in the sensor of Carr as taught by McDearmon, such that the magnet back sensor's magnetic axis facing the teeth would be parallel to the rotation axis of the target. One having ordinary skill in the art would do so because placements of teeth in such positions are merely alternative arrangement of the parts (See McDearmon paragraph 0032).

Regarding claims 26, 28, 30, 35 and 36, Carr teaches the sensor features noted above, but not a spiral tooth or parallel magnetic fields and rotating axes. McDearmon teaches a method for determining absolute angular positions and/or speed using magnetic sensors wherein the teeth of the rotary object are spiral shaped teeth, such that target delivers a linear induction function as a function of displacement, the target comprises at least one spiral tooth, the maximum measurable travel is 360 degrees and the induction as a function of position is linear over the travel range (See McDearmon FIGS. 1-5, note sensor 5 and spiral tooth 6 and see paragraphs 0021-0042). It would have been obvious at the time the invention was made to incorporate the sensor arrangement of Carr into the angular position system of McDearmon. One having ordinary skill in the art would do so because McDearmon does not teach the

particulars of its sensor, but states it uses a back biased magnetosensitive sensor along with a ferromagnetic target in its apparatus (See McDearmon paragraph 0022) which is precisely what is taught by Carr which provides a back biased sensor that does not require a particular orientation between the sensor and the gear (See Carr col. 1, lines 16-25).

Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carr in view of Woyton (US3916326). Regarding these claims, Carr teaches the target having generally rectangular teeth. Woyton teaches a rotational sensing system having a sensor arrangement and a target having a plurality of spiral teeth comprising at three teeth disposed at an angle of 120 degrees (See Woyton FIG. 1, note sensor 15 and 16 and note spiral toothed target 14). It would have been obvious at the time the invention was made to incorporate spiral teeth in the target of Woyton. One having ordinary skill in the art would do so to determine the direction of rotation of the target (See Woyton col. 1, line 33 to col. 2, line 47).

Allowable Subject Matter

Claim 34 is allowed. It is allowed for those reasons outlined in the Final Office Action mailed December 17, 2007.

Response to Arguments

Applicant's arguments filed April 10, 2009 have been fully considered and they are moot in part due to the substantial amendments to the claims which required new rejections. Accordingly, the rejections applying Dilger et al. (US5670876), the rejections applying Woyton in view of Jansseune and the rejections applying McDearmon in view of Jansseune are withdrawn.

However, the argument relating to the rejections applying Hattori and Carr are not persuasive.

Regarding the rejections applying Hattori, Applicants assert that Hattori does not detect the “presence” of the target. However, if it was not for the target being present in front of the sensor and moving, no signal would be measured. While it is not disputed that Hattori can only measure the target when it is moving, if the target is not present in front of the sensor, then no measurement would be made. Thus, Hattori does indeed disclose detecting “a magnetic induction caused by the presence of the target and related to the air gap" as recited in the claims.

Regarding the rejections applying Carr, Applicants make a similar argument as that for Hattori, i.e., that Carr does not disclose detecting the presence of the target. Initially, it is explicitly stated in Carr that this is precisely what the device in Carr does (See Carr col. 2, lines 26-29). Secondly, for the same reasons as to Hattori above, the sensor would not operate as disclosed in Carr unless the target is present. Furthermore, the sensor in Carr is a Hall sensor, i.e., an active sensor. As such,

movement is not required for a measurement to be made and thus the sensor when activated always detects the presence of the target, whether or not the target is moving.

Applicants also assert that Carr does not teach or suggest "the target having a geometric configuration as function of the position of the target corresponds to a predefined function. However, Carr discloses precisely this as this is simply a property of any similar toothed target (See Applicants own invention in FIGS. 2 and 5 of the present application wherein three spiraled teeth make up the target having such a function). In Carr, its target has a plurality of teeth and a function can be mapped to the shape of the teeth in a predefined way.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The newly cited art illustrates a magnetic sensor located in a cavity of a magnet.

Applicant's substantial amendments necessitated the new/amended ground of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENNETH J. WHITTINGTON whose telephone number is (571)272-2264. The examiner can normally be reached on Monday-Friday, 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Assouad can be reached on (571) 272-2210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Kenneth J Whittington/
Primary Examiner, Art Unit 2858

kjw